Homework 2

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1.6.16

```
salaries <- c(
  152, 169, 178, 179, 185, 188, 195, 196, 198, 203, 204, 209, 210, 212, 214
  )
```

a.

```
xbar <- mean(salaries)
s2 <- var(salaries)
```

The mean is 192.8 and the variance is 312.3142857.

b.

```
salaries_5000 <- salaries + 5
salaries_5 <- salaries * 1.05
```

i. The mean is 197.8 and the variance is 312.3142857.

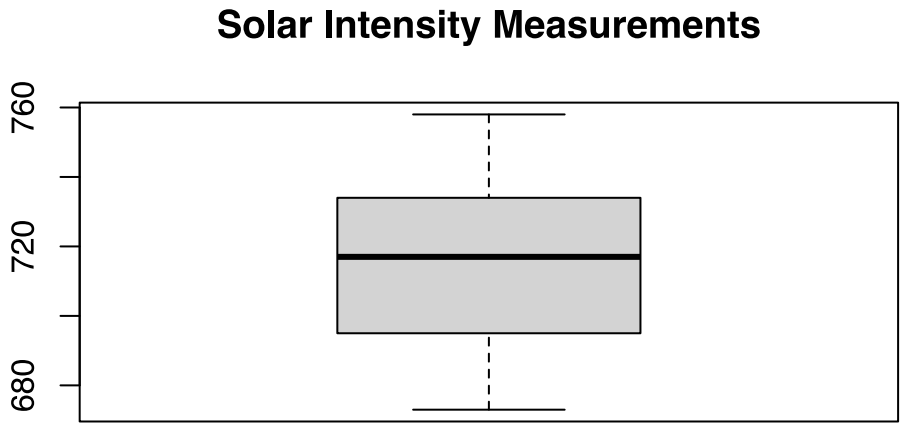
ii. The mean is 202.44 and the variance is 344.3265.

1.7.4

```
si <- read.table(
  "https://media.pearsoncmg.com/cmg/pmmg_mml_shared/mathstatsresources/Akritas/
SolarIntensAuData.txt",
  header = T
  )
```

a.

```
boxplot(si$SI, main="Solar Intensity Measurements")
```



b.

```
quants <- quantile(si$SI, c(0.3, 0.6, 0.9))
```

The 30th quantile is 700.7, the 60th 720.8, and the 90th 746.

2.2.10

a.

- $E_1 = 21$
- $E_2 = 14$
- $E_3 = 30$
- RR

c.

- $E_1 \cap E_2$: Disks that are both low hardness and low shock absorption.
- $E_1 \cup E_2$: Disks that are low hardness or low shock absorption.
- $E_1 - E_2$: Disks that are low hardness but not low shock absorption.
- $(E_1 - E_2)(E_2 - E_1)$: Disks that are either low hardness or low shock absorption, but not both.

d.

- $E_1 union E_2$: 5
- $E_1 \cup E_2$: 30
- $E_1 - E_2$: 16
- $(E_1 - E_2) \cup (E_2 - E_1)$: 25

2.3.9

a. $\binom{12}{4} = 495$

b. $\binom{5}{2} \cdot \binom{4}{1} \cdot \binom{3}{1} = 120$

c. $\frac{120}{495} \approx 0.242$